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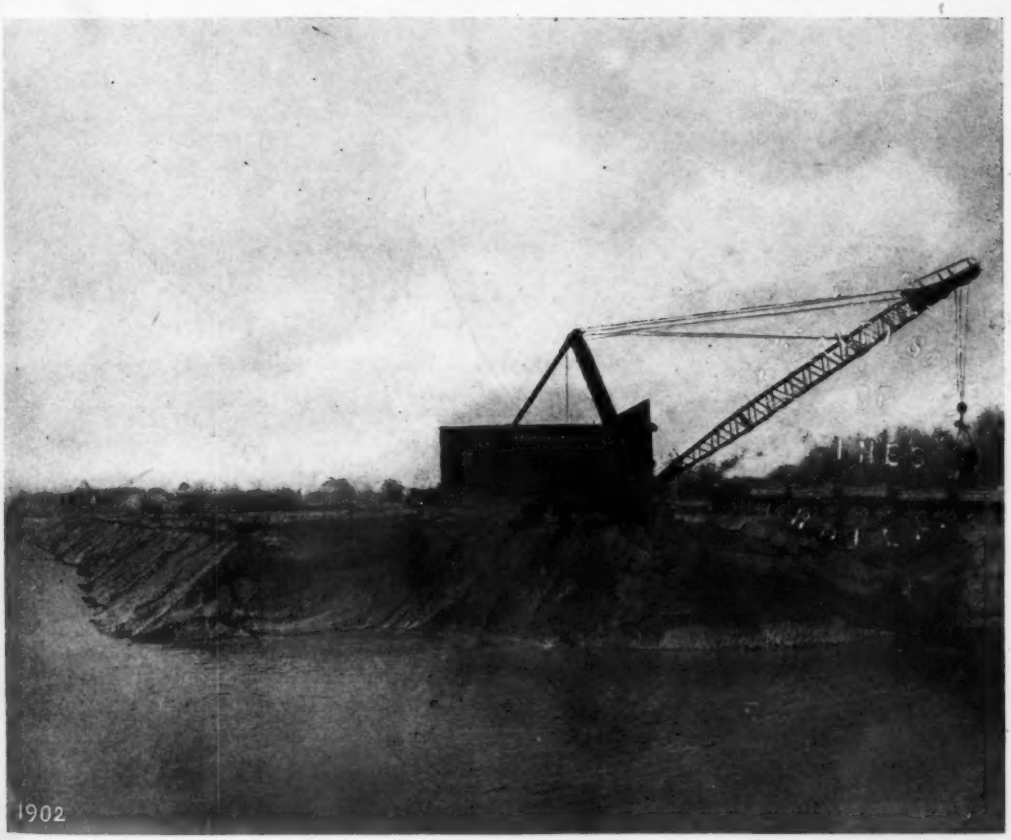
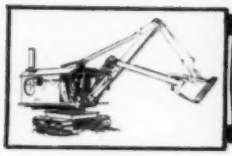
The EXCAVATING ENGINEER

Vol. XV No. 5 MAY, 1921





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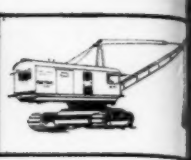


The 30-B Universal Shovel

Hits the Bull's-Eye of All-Around Efficiency

It May Be Equipped

as a One-Yard Shovel
as a Dragline Excavator
as a Crane
as a Sewer Shovel
as a Clamshell
with various other attachments

With the minimum of changes

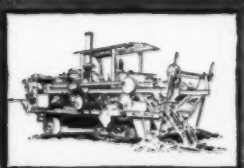
It Will Pay You to Investigate

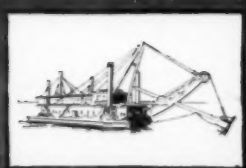
Send Now for Bulletin C-301-S

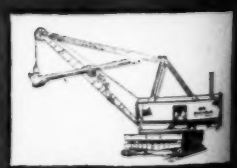
BUCYRUS COMPANY

South Milwaukee, Wis.

For List of Offices and Representatives See Last Page This Issue 333







For convenience in making inquiry use postal inserted in this number.

A Man-Size Shovel

13824 Cu. Yds. per 24 Hrs.

The Bucyrus Shovel, the largest electric shovel in the world, has a capacity of 13824 cu. yds. per 24 hrs. of operation. It operates on a cycle of 45 sec. and handles 8 cu. yds. per cycle.

This shovel is equipped with the following Westinghouse A. C. motors:—

Two—250 hp. motors operating the hoist.
One—150 hp. motor operating the swing.
One—150 hp. motor operating the thrust.

Two of these shovels are used by the Hydro Electric Co. of Niagara, and one is used by the Chili Exploration Co. of Chuquicamata, Chile, S. A.

Westinghouse Electric & Manufacturing Co.
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UMI

A general view of the excavation for the foundation of piers 5 and 6, of the Black Street Bridge, Hamilton, Ohio, taken November 19, 1920. Th gives a good idea of how the earth cofferdam was constructed by the dragline excavator, instead of using the usual sheet steel cofferdam method

This view was taken from the same position as the one above, two months later. The excavation and enclosing earth cofferdam shown in the photo graph above have disappeared. The piles between the piers are to support the forms for the bridge arches.

The Excavating Engineer

Vol. 15 MAY 1921 No. 5

Digging Bridge Pier Foundations and Driving Piles with a Dragline Excavator

A Description of the Work at Hamilton, Ohio, Shows the Remarkable Adaptability of the Dragline as a Construction Tool

IN the Excavating Engineer for December 1920 appeared an article on "Excavating Foundations for Bridge Piers with a Dragline Excavator." This article gave a short description of a method of excavating for bridge pier foundations without constructing the cofferdams which are usually used for this kind of work.

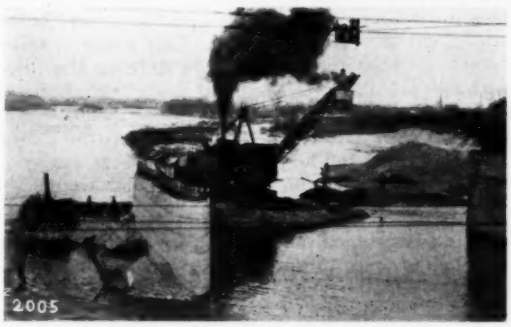
The Miami Conservancy Bulletin for February 1921 gives a more complete description of this work, and we are indebted to the Bulletin for the additional information in regard to this interesting job, which we give here.

The excavation work on the Black Street Bridge at Hamilton, Ohio, shows in a striking manner the remarkable adaptability of the dragline excavator as a construction tool. Engineers in charge of this work decided to use, for excavating the bridge pier foundations, a Class-14 Bucyrus dragline, mounted on caterpillar traction and equipped with a 70-foot boom and 1½ yd. bucket. The usual method of digging bridge pier excavations is by using caissons or cofferdams. Both these methods are comparatively slow and expensive. Where a cofferdam is used the excavation must be done with a clamshell bucket. The cross braces which are required to hold the cofferdam against the outside water pressure seriously interfere with the efficient and economical operation of a bucket inside the cofferdam.

Using a Dragline Instead of a Clamshell

These difficulties were overcome by doing the excavation with a dragline and piling the excavated material around the site of the pier foundation to form an earth cofferdam.

The advantages of this method of excavation over the caisson or cofferdam method are obvious. The digging was done under water, and no pumping was necessary till the excavation was practically complete. Braces were of course unnecessary as the slope of the sides of the earth cofferdam was made sufficient to withstand the outside pressure. Leakage through the earth walls was found to be surprisingly small, due to the fact that the mud and silt carried in the river water filled up the gravel walls to a large extent.



Another view of the dragline in the same position as in the bottom view on the opposite page. Excavation for the bridge piers has been completed and the dragline is moving back to the east bank of the river, by building an embankment for itself to travel on. The cableway for handling concrete is seen above the dragline.

The placing of the foundation piles was also much easier by this method than when the ordinary steel cofferdam was used. With a sheet piling cofferdam all piles would have to be swung, spotted, lowered and driven through the criss-cross of timbers within the cofferdam. In driving piles in the earth cofferdam dug by the dragline all this work was done in the open without interference. This made possible a considerable saving in time and money.

An Unusual Use for a Dragline

In driving the piles the all-around usefulness of the dragline was again demonstrated. As one of our photographs shows, the bucket was removed and the pile driver leads hung from the end of the boom with cable lashings. The dragline then became practically a caterpillar-mounted locomotive crane, for handling the pile driver. Steam for the pile driver was supplied from the dragline boiler.

The ease with which the dragline could be moved about and swung as desired made the placing and driving of the piles a comparatively easy job. The pile driver mechanism was attached to the hoist cable of the dragline so that it could be easily raised or lowered in the leads. The boom hoist was used in lifting the leads and placing them in position for driving the different piles. The drag line was run through a pulley at the end of the boom and used for handling piles.

Efficiency of the Dragline as a Pile Driver

In driving a pile the leads were placed in position and the boom lowered thus bringing the weight of the boom on the pile driver leads and causing them to sink about two feet into the gravel. Held by the boom at the top and the gravel below no guy wires were necessary. This made possible a considerable saving of time in driving the piles. With the pile driver equipment described above, as many as 52 piles were swung, spotted, and driven home with an average penetration into the gravel of 18 ft. in one ten-hour shift. This is going some, as any contractor who is onto his job will testify.

The Miami Conservancy Bulletin gives the following advantages of the dragline method of digging bridge pier foundations over the cofferdam method:

Quicker handling of the bucket due to lack of interference from a network of braces.

Superiority of the dragline over the clamshell bucket as an excavating implement.

The superior efficiency of the caterpillar mounted dragline in handling the pile driver.

Cutting out of pump costs during excavation.

Cutting out of costs due to sheet steel piling and bracing.

There are no important objections to this method of excavating for bridge pier foundations as compared to the cofferdam method. It is of course obvious that more material must be excavated, due to the flat slopes of the earth cofferdam, but this is largely offset by the much cheaper cost per yard of excavation done in the open by a dragline. High water, coming while the work is in progress, is liable to carry away part of the earth cofferdam. On this job the water rose high enough once to flood the cofferdam. Part of a corner and one side were carried away, but the damage was readily repaired.

The Miami Conservancy Bulletin gives the following opinion regarding this use of a dragline excavator:

"Considering the simplicity and directness of this method, and in the light of the experience at Hamilton, it would seem to be of a considerably wider application than it has had. Its neglect is perhaps due to the apparent lack of general information among engineers and contractors regarding the merits of the dragline excavator as an all-around construction tool. The gospel of the dragline needs to be more widely spread."

A Class-14 Bucyrus dragline excavator converted into a pile driver by removing the bucket and attaching pile driver leads to the boom with cable lashings. The pile driver cylinder was raised and lowered by the hoist cable, and the drag line, run through a pulley at the end of the boom, was used for handling piles. The dragline proved very successful for this work. A finished pier footing can be seen at the right, surmounted by the pier shaft form. A similar footing will rest on top of the piles which are being driven.

Operations of The Birmingham Slag Company

This company is operating eight steam shovels in and around Birmingham, loading slag. Description of plants at Ensley and Alabama City, Alabama.

THE Birmingham Slag Company is operating in and around Birmingham, a chain of slag crushing and screening plants, two of which are undoubtedly the most up to date in the country. This Company is fortunate to have as an asset, the operating experience of two generations of Ohio quarry men in their plants at Ensley and Alabama City. Charles L. Ireland, for many years associated with the France Brothers in the France Stone Company of Toledo, and his three sons, H. G. Ireland, Vice President and General Manager; C. E. Ireland, Sales Manager and C. B. Ireland, Assistant General Manager constitute the main source for the many original ideas incorporated in these plants.

Crushing and screening plant of Birmingham Slag Company at Ensley, Alabama. One of the most up to date in the country.

Steam Shovel Equipment

The Birmingham Slag Company has eight shovels in operation in their various slag pits.

12-yard Side Dump Cars Handled by Electric Motor Cars

Four Bucyrus shovels are at Ensley, two 95-ton, a 70-C and a 65-ton. A Model 60 Marion is in operation at Alabama City, whereas another 70-C is working near Pratt City in the plant of the Republic Iron and Steel Company, another Model 60 at Sheffield and a Model 21 Marion at the Alice Furnace in Birmingham.

The shovels at Pratt City, Sheffield and Birmingham are loading bank run slag for railroad ballast.

The Ensley Plant

The plant at Ensley is located on the property of the Tennessee Coal Iron and Railroad Company. This plant is said to be the largest individual slag crushing and screening plant in the United States, having a maximum guaranteed output of 4,000 tons of crushed and screened slag in the ten standard sizes.

Steam Shovel Operation

The Tennessee Coal and Iron Company operates six blast furnaces which produce an average of

Views of steam shovel operation in slag troughs at Ensley. One of the 95-ton Bucyrus shovels in action.

3,000 tons of slag per day, seven days per week. The molten slag is poured in four permanent troughs alongside the slag plant under the control and direction of the slag company. It is planned eventually to increase this to 6 troughs.

This arrangement permits the employment of the most scientific methods in order to obtain a slag of maximum density. It furthermore makes it possible to deposit this slag in the troughs in such a manner as permits the greatest economy and efficiency in excavation.

The shovels load trains of six 12-yard side dump cars, handled by six electric motor cars over a permanent track owned by the slag company, equipped with a third rail.

The toughness of the material makes very difficult digging. Consequently special dippers are used which are equipped with lips provided with pockets to take special teeth with tool steel points. These dipper teeth are long and sharp, being about three inches in cross-section with long tapering points.

At the other points the slag is shattered with explosives before being excavated, consequently the heaviest digging is done by the 95-ton and 95-C Bucyrus machines at Ensley.

The Crushing Plant

The Ensley plant was designed by the Allis-Chalmers Manufacturing Company, Milwaukee and contains many unusual features.

The slag is dumped from the cars into a concrete hopper feeding a shaking grizzly. The material passing the grizzly by-passes the No. 8 gyratory crusher and is chuted to the loading hopper of the skip hoist. Everything that passes over the grizzly also goes over a magnetic roll which separates the pieces of material composed wholly or largely of iron. The iron goes to a concrete pit alongside the crusher, from which it is loaded out by means of an electric crane and magnet. The crusher is set in a concrete lined pit and discharges to the receiving hopper of a balanced skip hoist. The skip cars are all steel of 8 cu. yd. capacity and operate on a 150-ft. incline to the top of the plant. The cars are filled and emptied automatically and are controlled by an electric hoist which also operates automatically.

The skips dump end-wise into a large bin, which is provided with two "sling feeders" or oscillating segmental gates. These feed the crushed slag automatically in a constant amount to two magnetic rolls, where all the small pieces of iron, which have been through the crusher, are removed and chuted to a concrete collection bin for return to the steel plant.

Screening Plant

The crushed slag passing the rolls is fed to screens adjacent to them. These screens are 2[illegible] ft. long and 5 ft. in diameter with ¾ in. perforated dust jackets on the upper halves. The screen plate

A Bucyrus 95-ton Shovel Loading Slag in the Troughs of the Ensley Plant

Troughs of Tennessee Coal & Iron Company, where 3000 tons of slag per day are poured. Two 90-ton, a 65-ton, and a 70-C Bucyrus shovels do the excavation.

are perforated to remove four sizes of material as follows: No. 1 (4 to 2½″) : No. 2 (2½″ to 1½″) : No. 3 (1½ to ¾″). The No. 5 (¾″ to dust) material passes through two vertical chutes at the head of the screens to the floor below where there are four small screens.

The smaller screens separate the No. 5 material (¾″ to dust) into three sizes as follows: No. 4 (¾ to ¼″); No. 6 (½ to ¼″); No. 7 (¼″ to dust).

The four small screens are of the electric vibrating type, and are known as the Mitchell Vibrating Screen, manufactured by the Stimpson Equipment Company, Salt Lake City, Utah. In addition to the four smaller vibrating screens, in the main plaint, there is one Mitchell Vibrating Screen installed outside the main plant over which the No. 7 (¼″ to dust) is screened to still finer sizes, i. e. No. 8 (¼″ to 10 mesh) and No. 9 (ten mesh to dust). No. 8 having been used as the aggregate in asphaltic concrete pavement.

The screening plant is designed so that it can be operated for a maximum capacity of 2,000 tons per day by using only one large and one small screen, or for a maximum capacity of 4,000 tons per day by using both pairs of screens. The screens are all driven by independent motors.

Storage and Loading Facilities.

The screened slag flows by gravity through chutes into concrete storage bins, which have a combined capacity of 1500 tons. By shifting the chutes two or more sizes can be mixed and shipped on short notice. Two loading tracks are provided under the slag bins. The cars as they are being loaded stand on 75 ft. track scales, which permits accurate loading to orders and saves much delay and annoyance in making shipments. This feature of the plant is considered one of its best, for much time and money was formerly lost in waiting for the railway company to take the cars to its scales, and then often times the slag company was compelled to remove 5 or 6 tons overload with the cars at some out-of-the-way place.

The slag company has, in conjunction with this plant, a machine shop in charge of Mr. R. B. Zuber, master mechanic, which is equipped to make all repairs to its equipment.

Slag dump about a mile from plant containing from ten to fifteen million tons of slag. This is used as reserve when plant is not producing requisite amount.

Slag Reserve Supply

Although the crushing and screening plant is designed to handle the entire daily output of the blast furnaces, it is not dependent on the operation of the furnaces for its supply of raw material. About a mile from the slag plant is a dump estimated to contain from 10,000,000 to 15,000,000 tons of old slag.

The slag company owns and operates a standard-gauge railway to this dump, which as the accompanying view shows, closely resembles a quarry

working. The face is 25 or 30 ft. or more high and is drilled with well drills and blasted as in any limestone quarry.

Alabama City Plant

The Birmingham Slag Company has recently completed a second crushing and screening plant at Alabama City, Alabama with a capacity of 2,000 tons of crushed and screened basic slag per day. The completion of this plant forges another link in their chain to all mineral aggregate users in the Southeastern States. The location of the new plant is on the property of the Gulf States Steel Company, giving the Birmingham Slag Company exclusive control of their entire output— a true basic slag of practically the identical quality of the well-known "Ensley Basic Slag" produced by the Birmingham Slag Company at their Ensley plant. The location of their Alabama City plant assures substantial savings—in lower freight rates—to all mineral aggregate users in North Georgia, North Alabama and South Carolina. Shipping service includes the weighing of all cars on their own track scales at the plant by a certified weigh-master and delivery by their own locomotives to the L. & N., Southern, and N. C. & St. L. Railways.

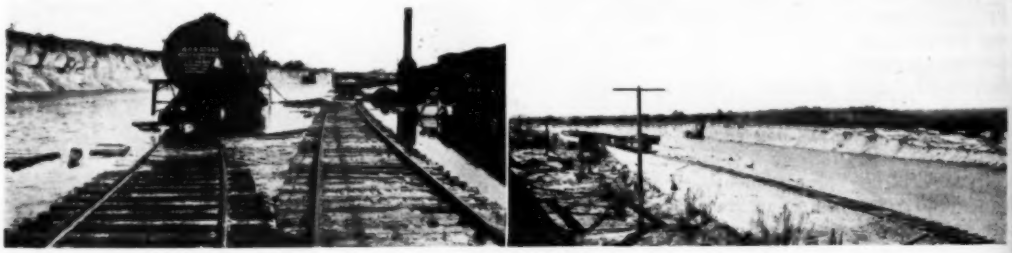
The Company has recently installed a brick plant at Ensley with a capacity of 30,000 bricks per day. Their bricks are made from slag screenings and cement.

We are indebted to H. G. Ireland, Vice President and General Manager for the above information.

Nueces Gravel Pit — Southern Pacific System

Description of Incidents in Connection with Its Operation, Steam Shovel Output and Suspension of Operations Due to Flooding, and the Method of Cutting Shovel Out of Flooded Pit

ON April 17th of last year, the Southern Pacific System in Texas opened up a gravel pit on an extensive deposit of gravel about 100 miles west of San Antonio, on the Houston Division, on the banks of the Nueces River.



Views of the Flooded Pit

The deposit is not only extensive and of unusually fine quality for ballasting material, but possesses the additional qualification of having no overburden which requires stripping. It is planned to install a crushing plant to take care of the larger boulders encountered.

The gravel from this pit has been used for the past year for ballasting part of the Southern Pacific Lines in Texas and Louisiana.

The pit was first opened up with a 70-ton Bucyrus shovel with a 2½ yd. dipper, which operated steadily for four months working double shifts. The career of this shovel, however, was put to an untimely end in July by a most unusual accident. It had been loading 40-yd. Rogers steel ballast cars, and incidentally had loaded as high as 117 of these cars in two 8-hour shifts, an output, as may be seen of 4680 cubic yards, including delays, which is very good going for a shovel of this size in this class of work.

On the fateful day, however, a train of eight of the cars had been loaded, hauled a few hundred feet up the track and dropped and a second train was being spotted at the shovel. Without warning, the loaded train got loose, whether the air leaked out or not is not known, however, they coasted down the grade and hit the train of empties at the shovel before the operator, W. S. Dixon, or his cranesman W. L. Gwyn, knew what was happening. Both men fortunately jumped to safety, Dixon being half way over the circle when the crash occurred.

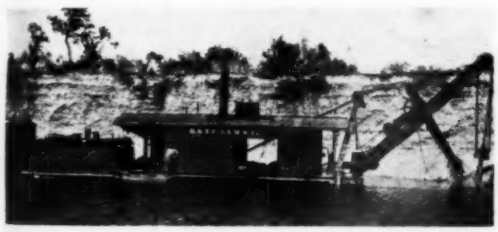
The collision bent one 40-yd. steel car in the shape of a hairpin and sent another through the shovel, successfully putting it out of commission.

The shovel has subsequently been repaired and is now in operation under the charge of J. W. Bailey in a Southern Pacific Quarry four miles west of Alpine, Texas where a new crusher has recently been installed.

70-ton Bucyrus After the Smash Up

The Bucyrus was promptly replaced by a Model 80 Marion with a 3½-yd. dipper which has been making the gravel fly up to early March, averaging forty 40-yd. Rogers ballast cars per day. The deposit has a maximum depth of 25 feet which, of course, is taken in one cut with six 40-yd. cars to a move.

This pit, however, opens up into the bed of the Nueces River, which for three years has been dry due to the fact that the river plunges underground four miles above the pit and emerges again three miles below. Early in March, however, unusually heavy rains at the headwaters of the Nueces swelled this stream beyond the capacity of its subterranean channel and consequently took the natural course of the old river bed. Meanwhile the Nueces pit had been excavated four feet below this channel. The result is shown in our views.



Model 80 Marion in Flooded Pit

Cutting Out of Flooded Pit

During the early part of April it was decided by the management to move the Model 80 shovel to the south side of the pit which was somewhat higher and consequently dryer. On April 6, therefore, the trick was accomplished.

As stated before, the shovel was standing in from 3 to 4 feet of water. It was, of course, standing on its own independent track sections parallel to the loading track with 25′ from the center of the shovel track to the center of the loading track.

The first move was to disconnect the loading track about 6 feet behind the shovel. This track was then thrown over and connected with the shovel track. Key ties and rail chairs were used to make the connection with two short pieces of rail cut to the desired length. The first problem was to get the track in line. In order to do this, bars were driven into the ground marking the direction of the track.

The shovel was then moved back slowly under its own power. About 60 feet had been covered when the rear truck left the rails. The ties at this point were so far apart that one pair of wheels went down between the ties. It was then necessary to lace ties in between the wider spaced ties in order to make a flooring and to bring the wheels up to where a frog could be set. The frogs were then set and spiked down and the shovel re-railed at the first pull. It should be noted that this was all accomplished under water and had to be done entirely by feeling, as the water was very muddy from being stirred up by the men working in it.

Form 1501

REPORT OF WORK PERFORMED BY STEAM SHOVEL

At _____ from _____ M. to _____ M. _____ 191__

		No. Cut	Yards per Car	Total Yards	Shovel No.	Make	Weight Tons	Dipper Capacity, Yards	Steam Pressure Allowable
LOADED	Steel Ballast, 30′								
	Rogers " 35′								
	" " 36′								
	Coal								
	Flat								
	Total								
TOTAL TO DATE									

DISPOSITION OF LOADS.

Rogers Ballast		
" "		
Steel "		
Coal "		
Flat "		
TOTAL		

PIT EXPENSE.

FORCE EMPLOYED	No.	Wages	Total Wages
Shovel Engineer			
" Craneman			
" Fireman			
" Watchmen			
" Pitmen			
Car Repairers			
Blacksmiths			
Drillers			
Powdermen			
Trackmen			
Foreman			
"			
Trainmen in Pit			
Engineers "			
Firemen "			
"			
Laborers			
TOTAL FORCE EXPENSE			
GRAND TOTAL COST, $			

SUPPLIES: SHOVEL, LOCOMOTIVES, CARS, ETC.

KIND USED	Qty.	Price	Cost
Valve Oil			
Engine "			
Car "			
Signal "			
Headlight Oil			
Powder			
Dynamite			
Caps and Fuse			
Tools, etc.			
Fuel, Waste, etc.			
Coal—Shovel			
" Engine			
Waste, C. C.			
" Wool			
TOTAL			
AVERAGE COST PER CUBIC YARD,		CTS.	

DELAYS.

DESCRIPTION	Hours	Min.	REMARKS
Waiting for Cars			
Moving Shovel			
Repairing Shovel			
" Locomotive			
Other Delays			
TOTAL DELAYS			

Kind of Material Handled _____

Character of Work Performed _____

Weather _____

_____ (SIGNATURE.)

_____ (OCCUPATION.)

This is the type of daily report sheet which the shovel operators are required to make out and mail each day to headquarters. The report is made out in triplicate, one copy is mailed to the Chief Engineer, one to the Division Superintendent, and one to the Division Engineer.

After the machine was re-railed it was taken back under its own power, a distance of 1000 feet through water which in places ran up to 4 feet in depth, and cut in on dry ground. It is now again in steady operation.

The credit for this unusual achievement has been given by our informant, Mr. W. S. Dixon, to Mr. H. I. Barnett, road master, who we understand was ably assisted by foremen M. Calk and Sam Harrison, together with eight Mexican laborers who, by the way, prove to be excellent divers. The shovel crew at the time consisted of W. S. Dixon with S. J. Anthony as cranesman.

We are indebted to Mr. W. S. Dixon for the above photographs and description.

Model 80 Marion in action in Nueces Pit. The shovel is an oil burner. Note absence of black smoke, although she is popping off. W. S. Dixon, engineer; S. J. Anthony, cranesman; John Moore, fireman.

Combining a State Highway with a Dike for Flood Protection

How the foresight of officials in charge of the construction of the North and South Highway at St. Maries, Idaho, made possible the reclamation of 1,400 acres of land. Detailed description of dragline operation on this job.

THE North and South Highway of Idaho, now under construction, coming from the south strikes the valley of the St. Joe River at the thriving little town of St. Maries. This river rises in the Bitter Root Mountains and empties in Coeur d'Alene Lake draining an area of approximately 1,375,000 acres. It is navigable for about 35 miles for large size boats and has been used as a means of transportation for 40 years. It is said to be the highest navigable stream in the world.

The Dragline Loaded on a Barge After One Section of the Dike Had Been Completed, Ready to Be Floated Down Stream to the Next Section of the Dike, Six Miles Below

From the head of navigation to the Lake, the river winds through a wide and very fertile valley, which is flooded annually, when the river rises. The extreme rise and fall of the river is about 16 feet.

For years many attempts were made, by ranchers occupying lands in the valley, to protect their lands from the annual overflow, by building dikes. But owing to the fact that these dikes were never properly constructed in regard to width, side slopes and heights, failures were common and frequent. Later under the provisions of the drainage

This view shows the dragline taking out the last few yards of the dike section nearest St. Maries. After finishing this section of the dike the dragline was loaded on the barge which can be seen in the view and floated down to the next dike section. The drawbridge in this view is said to be the highest in the world. The elevation is 2137 feet above sea level.

laws of Idaho, drainage districts were formed and funds raised to be applied to the construction of dikes, protecting larger areas. The same errors regarding design of dike sections were continued and failures often resulted during unusual high water stages.

A New Idea in State Highway Construction

When construction of the North and South Highway reached the St. Joe Valley, engineers in charge of the work decided on a very unusual method of construction. They proposed to con-

Another view of the dike near St. Maries showing the dragline at work in the distance. This shows how a narrow section of bank was left between the borrow pit and the river to avoid wet digging. In some places the borrow pit was carried 10 feet below the river level.

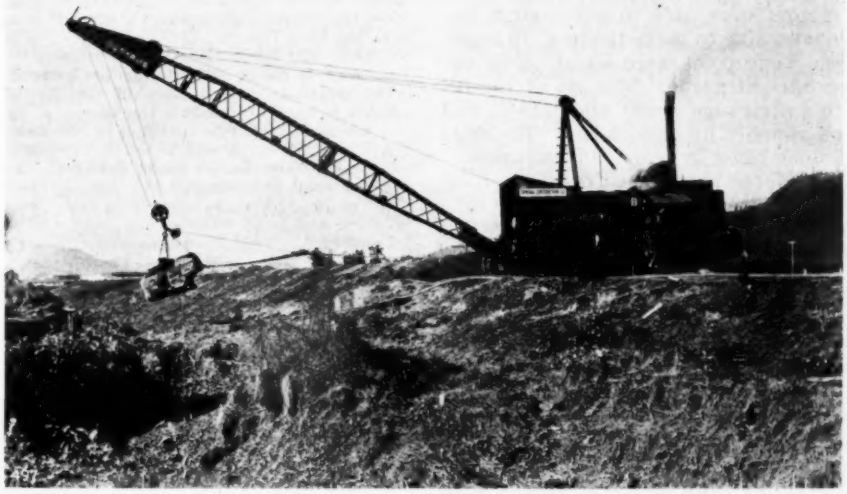
bine the state highway with a dike to prevent flooding of the lands near the river, by running the highway along the top of the dike.

From a highway engineering standpoint the proposition of building a combined state highway and dike is very unique. Objection was taken on the ground that the State was not in the business of building dikes or reclaiming lands. However, Mr. W. I. Bassett, State District Engineer, and Mr. J. B. Sargent, Resident Engineer, who were in charge of the work, took the position that governments as well as individuals should be in the business of doing all they can to improve conditions so that more homes are created, more agricultural products raised, and the amount of taxable property increased. Mr. Bassett was strongly in favor of the idea from the outset and to him is due most of the credit for putting it over. Authorities in charge of highway work in the State finally agreed to the building of the combined highway and dike and work was started. The project was known as Federal Aid Project No. 31 and was financed jointly by the Federal Government, the State of Idaho and the local Highway District.

Description of the Work

The amount of the contract, which was awarded to the General Construction Company of Spokane, Washington, was $211,293.23. The contract calls for the construction of 8 miles of the North and South Highway surfaced with 6″ of crushed rock macadam, with grading, clearing, culverts, etc.

Two sections of the highway will serve the double purpose of dike and highway. The highway crosses the St. Joe River at St. Maries over a drawbridge and it is here that the first dike section begins. The highway follows the river here for about two miles, and this dike reclaims about 500 acres of land. The highway then follows the foothills for about two and three quarters miles before it strikes the river again. The second dike section then begins, and continues along the river for



The Class-14 Bucyrus Dragline at Work on a Section of the Combined State Highway and Dike near St. Maries, Idaho

about three miles, reclaiming about 900 acres of land. The project ends with the end of this section.

The maximum fill necessary on the dike sections is 16½ feet, the minimum fill is about 7 feet. The cross section consists of the 20 foot roadbed, with a 2½ to 1 slope toward the river and 1 to 1½ slope on the other side. Between the dike sections the excavation is side-hill work. This side-hill excavation was done with wheelers, fresnos and trucks.

A completed section of the dike which will be used as the foundation for this section of the Idaho North and South Highway. It will be surfaced with six inches of crushed rock macadam.

Dragline Operation

Excavation for the dike was done with a Class-14 Bucyrus dragline, equipped with a 60 foot boom and 2-yard bucket. The center line of the dike was run on an average of 120 feet back from the river, just far enough back to grab a portion of an old dike which ran along the shore of the river.

The contractors were able to get enough dry dirt out of this old dike to make the new fill stand in good shape. Long poles were set ahead of the fill with cross bars at grade. The top of the fill was carried to a shrinkage grade, about 15%, and was leveled off roughly by hand labor. The final finishing was done later by teams and scrapers.

As our photographs show, most of the dirt for the fill was taken from the area between the dike and the river. The slope of the borrow pit was 2½ to 1. A rim of bank was left between the pit and the river to prevent wet digging. In some places the bottom of the borrow pit was carried 10 feet below the level of the river without serious trouble from water. The dragline worked along ahead of the fill at about the toe of the slope.

The dragline crew consisted of six men per shift and two shifts per day were worked. The average yardage made per day was 2310 cubic yards. The record yardage was about 2700 cubic yards.

After the dragline work on the section of dike nearest St. Maries had been completed, the dragline was loaded on a barge and floated down the river to the last section of dike.

The engineers in charge of the work deserve a great deal of credit for their foresight in thus combining a state highway with a dike. This not only makes a very good foundation for a highway, but reclaims over 1,400 acres of fertile farm land thus adding considerably to the wealth of the State of Idaho.

Texas to Have Largest Reservoir in the World

Preliminary surveys have recently been made for an irrigation project in Texas which will represent an investment of $60,000 and will include the construction of the largest reservoir in the world. A dam 250 feet high will be constructed which will impound 2,600,000 acre feet of water. The dam and reservoir will be in the Big Bend county of the Rio Grande, about 550 miles above Brownsville, Texas. The work is under the direction of the United States Reclamation Service.

This project when completed will be larger than the Elephant Butte Project near El Paso which impounds 2,500,000 acre feet of water and is at present the largest in the world.

The new dam and reservoir when completed will irrigate nearly 1,000,000 acres of land in Cameron and Hidalgo Counties. This includes 175,000 acres of land now irrigated by private pumping operations.

The new project will include three separate dams. The main dam 550 miles above Brownsville will be 250 feet high, and will create the reservoir. Two other dams will be constructed, one 60 feet in height at a point 15 miles above Brownsville, and another 10 feet in height 5 miles above Brownsville. These two will be diversion dams, used to divert the water from the river channel into irrigation ditches. The big reservoir will make possible an unfailing supply of water at all times.

Birmingham Slag Company Completes Brick and Tile Factory

Birmingham blast furnace slag, formerly a waste product, has found a new and most serviceable as well as attractive use in the form of face brick and tile.

The Birmingham Slag company has completed at Ensley the erection of a factory for the production of brick and tile composed of five-sixths furnace slag and one-sixth cement. The product is already on the market. It is called Slag Tex.

Both the brick and the tile take any color desired. The color is partly infused, as the cement and slag are being mixed in the molds, but the finishing color and texture is superimposed on the face.

About $50,000 was invested in the new plant at Ensley, where the large slag plant of the company is located adjacent to the Ensley blast furnaces, from which the raw material is secured.

The product takes every hue and surface of the clay product, and is of unusual hardness and impenetrability by moisture.

Turned Down

A tramp rapped on a kitchen door and John, the Chinese cook, appeared promptly.

"Gee, bo, I'm hungry," whined the tramp, and then he got off a long tale of woe and misfortune. There were tears in his eyes as he wound up in a broken voice:

"So, for the love of Mike, give a starvin' man a bite to eat, won't ye, bo?"

John smiled a broad, bland smile.

"Like fish?"

"Sure, I like fish!" said the tramp, heartily.

"Call Friday," said John, and slammed the door.

—*Washington Star*

The Excavating Engineer

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THE EXCAVATING ENGINEER PUBLISHING CO.

Bradlee Van Brunt, Manager and Editor

South Milwaukee, Wisconsin

Spread the Gospel of the Dragline!

In this issue of The Excavating Engineer we publish an article entitled "Digging Bridge Pier Foundations and Driving Piles with a Dragline Excavator," wherein we describe how the engineers of the Miami Conservancy District used a dragline excavator, not only for the unusual purpose of excavating for bridge pier foundations, a job heretofore done almost universally with a grab bucket, but for the actual driving of the piles for these foundations.

Commenting on this use of the dragline excavator, The Miami Conservancy Bulletin in their issue of February, states as follows:

"Considering the simplicity and directness of the method, and in the light of the experience at Hamilton, it would seem to be of a considerably wider application than it has had. Its neglect is perhaps due to the apparent lack of general information among engineers and contractors regarding the merits of the dragline excavator as an all around construction tool. The gospel of the dragline needs to be more widely spread."

The Excavating Engineer has on many occasions preached the gospel of the dragline. We have endeavored to show that this machine was a remarkably flexible tool in the hands of a good man. We have tried to impress upon new contractors as well as upon those older ones, who have been wedded through many years of hard experience to certain rigid methods and equipment, the remarkable versatility of this machine.

The most prominent features of the dragline are its long boom, the fact that it may swing in a complete circle and its consequent wide working range; the fact that it may be operated by steam, electricity or gasoline as conditions prescribe; the fact that it may be mounted on trucks, skids and rollers and all except the larger sizes, on caterpillars.

Practice has proven conclusively that it can dig above or below its own level with equal facility; it can excavate under water while standing on dry land, load dump cars as well as a steam shovel, trim slopes to a nicety, build water-tight levees, operate over soft ground that would swallow a steam shovel, in many instances do the work of a dredge with greater economy and speed, excavate the hardest materials, serve as a crane and mounted on a barge it can operate as a dredge. We now learn that an ingenious engineer actually fitted it with leads and hammer and used it with great success to drive piles.

Furthermore, as any operator can testify, it is simple to handle, easy to move about and can make the dirt fly.

The gospel of the dragline, indeed, needs to be more widely spread.

Hiram A. Clapp

Hiram A. Clapp, senior member of the well-known firm of Clapp, Norstrom & Riley, of Chicago, died on April 11 in San Diego, California, where for many months he had been suffering from an ailment of long standing.

Through Mr. Clapp's death the construction world loses not only one of its pioneers, but one of its best known and most prominent figures. The deep sense of loss following this news will not only be found in the offices of the big contractors, engineers and manufacturers of the country, but will be felt keenly and deeply on many jobs and in many camps throughout this continent where steam shovel work is in progress.

Mr. Clapp's position in the earth moving world was unique. He started business in Chicago in 1880 and rapidly built up the reputation of his firm until he became known all over the American continent. His boundless energy, keen business sense, clean spirit of justice and genial nature drew to him a host of friends in all walks of life.

For thirty years his offices on Canal Street were the recognized headquarters of contractors and railroad men passing through the city to the big jobs that built up our great western country.

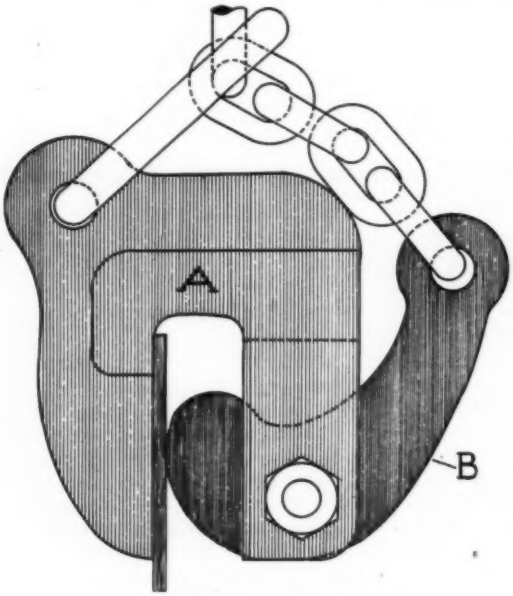
His counsel and guidance was sought on all sides. Indeed, it was the sage advice of Mr. Clapp which was sought as a matter of course before the first issue of The Excavating Engineer was printed and it was to a great extent upon this advice that the policy, which we have subsequently followed, was based.

Mr. Clapp was born in Delphi, Indiana and was sixty-eight years of age. He was buried in Chicago on April 16.

· FIELD NOTES ·

A Safety Hook for Handling Plates

Mr. Al. Geddes, a well-known shovel operator of Brooklyn, New York, has sent us the following description of a safety hook which he has been using with a crane for loading rails. This hook has proven very satisfactory for this work and combines safety with ease of operation. We are glad to publish this as it will no doubt be of interest to crane or steam shovel operators who have rails, plates or other similar material to handle.



The Comrie Safety Hook (Patented)

This hook is known as the "Comrie Safety Hook" and is manufactured by Mr. Alexander Comrie, 44 Quinlan Avenue, West New Brighton, Staten Island, New York. The stock, "A," is made of forged steel and the tongue, "B," of tempered tool steel. It will handle safely a load of five tons. The drawing shows clearly the method of operation which is very simple. This hook is constructed so that the strength of the gripping force increases with the weight of the load. It can be used for handling plates, bars, slabs, rails, piling, pipe, in fact anything that the jaw will grip.

Mr. Geddes says that he has seen this hook used for pulling steel piling. It is very satisfactory for this work and there is no trouble on account of the hook slipping.

This hook can of course be used on any steam shovel by hooking the chain over the dipper teeth or padlock.

Additional information about the Comrie Safety Hook may be obtained by writing the manufacturer, at the address given above, using for this purpose one of the blank postal cards inclosed in this magazine.

Don't Lengthen Your Wrenches

By W. F. Schaphorst

I have several times seen the "kink" in print which shows how to make a wrench longer by "slipping a gas pipe over." It is a very simple procedure, and it may look and sound good to some, but I don't believe in making a wrench longer in order to put nuts on tighter.

As you doubtless have observed, wrenches for small nuts are invariably short; for medium nuts, medium in length; and for large nuts, they are long. The manufacturers therefore seem to have some "system" in making wrench lengths, and they have. The pitch of the thread is considered, the cross-sectional area of the bolt at the bottom of the threads is considered, and the strength of the man who does the tightening is also considered.

To make a wrench "twice as long" you therefore increase the tension on the bolt to twice the amount, the force of pull on the wrench being the same. By increasing wrench lengths I have frequently actually "stretched" bolts until they broke in two, or I stopped turning as soon as I felt the bolt begin to stretch. This is poor practice, and I do not do it any more. I do not increase the wrench's length any more because I realize that the elastic limit of a bolt should never be reached.

If you feel like making a wrench longer for "unscrewing" a nut—all right. But don't make it longer for tightening.

Ain't You Right, Mother?

"Mother, what is a Dry Martini?"
"Heavens on Earth, child!"
"Oh!" —*Sun Dodger.*

Laugh This Off, Too

He (at box-office): Have you got a seat left?
Ticket Seller (indicating the number): Yes, U21?
He: I am, and if it's that kind of a show I'm glad I did not ask my mother to come with me. —*Ex.*

His Early Training

The detail had just arrived near the front lines when the captain looked around and noticed a private, hatless and coatless.

"Where's the rest of your uniform?" he demanded.

"Back where we came from."

"Go back and get it."

The private vanished and later reappeared, correctly uniformed but without his rifle.

"Where's your gun?"

"Left it back where we came from."

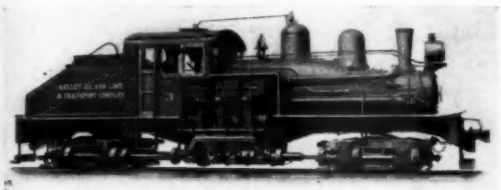
"Listen!" bellowed the captain. "You're a fine soldier. What were you in civilian life?"

"Plumber's assistant." —*American Legion Weekly.*

DEVICES YOU OUGHT · TO KNOW ABOUT ·

The Geared Locomotive in Open Pit Work

In quarrying, stripping, and open cut excavating service the successful and efficient operation of the entire plant often depends upon the haulage facilities. Upon the efficiency, dependability, and maintenance of the transportation system hangs the question of whether the operation will be profitable or otherwise. The foundation of the transportation system is the type of motive power used, hence the importance of selecting the type of locomotive best suited for the service involved. Varying conditions in operation require different sizes and types of locomotives to handle the work most effectively. Locomotives are required which will handle the loads in the most efficient way, which can be depended upon to give the greatest continuity of service and which can be maintained at a minimum cost for repairs and replacements.



The Total Weight of Both Engine and Tender is Used for Tractive Effort

Since the location of the working places in excavating work is constantly shifting, it is not generally advisable to spend sufficient money to provide a permanent road bed of heavy, well-laid track. Consequently the track is more or less of a temporary nature. It is shifted from time to time, is more or less uneven and is often laid with short curves and wide tie spacing. Therefore, one of the fundamental considerations is to select a locomotive which will operate satisfactorily over track of this character at a minimum cost of maintenance both to the engine and the track. Moreover, the locomotive is often required to operate over heavy grades requiring high tractive power. It is often necessary to start loads on these grades, and locomotive selection should take into consideration this condition calling for maximum starting power. Where steam shovels are to be served still another element enters into the choice of the type of locomotive to be used.

This is the spotting of cars, requiring rapid acceleration for a short distance, with a strong steady pull to eliminate the necessity of taking slack with the attendant breaking of couplings. Spotting must also be done at the crusher, dumps, or weighing machines.

The above conditions of operation require an engine which can start cars quickly, take sharp curves, operate on rough and uneven track, and pull up steep grades.

An engine to do this must have quick starting, flexibility, short rigid wheel base, light unit wheel loads, steady pull on grades, and good steaming capacity.

The accompanying illustration shows the Shay Geared Locomotive built by the Lima Locomotive Works, Lima, O. These engines are especially adapted to excavating service and they meet the requirements outlined above, better than any other class of motive power. It has been repeatedly demonstrated that this type of engine can be depended upon to increase output.

It will be noted from the illustrations that the total weight of the locomotive is carried on the driving wheels, spaced far enough apart to distribute the weight of the locomotive. The locomotive is supported on trucks, each having a center plate, which permits the truck to turn freely. The frame is stabilized by side bearings so arranged as to permit easy curving and give flexibility.

The three cylinder engine driving through gears gives a constant torque and produces an even and powerful pull. All the wheels are driving wheels, so that the total weight of both engine and tender is used for tractive effort.

Therefore, a Shay Locomotive of the same weight as a direct locomotive and its tender will produce a much greater draw-bar pull.

Through the absence of any counterbalance in the driving wheels the Shay Geared Locomotive operates on track too light for a direct engine of the same axle load. It does not hammer the track.

All wheels are driven by means of gears connected on the driving crank shaft. To compensate for curves, the driving shafts are provided with universal couplings and slip joints, giving a flexibility of construction which accommodates itself very freely to curves and uneven track.

Careful tests of a Shay and direct locomotive showed the former to require 22 per cent less time to accelerate to speed than a rod engine.

Spotting tests revealed a superiority of 11% in speed, and much greater accuracy, in favor of the Shay.

The boilers are arranged to burn either coal, wood or oil and are designed with ample steaming capacity. The smaller sizes of engines are built for any gauge from 18″ up. The larger sizes are built for 36″ gauge and up.

"Shays" are easily operated, so that an engineer who can operate a traction engine will quickly learn to run a Shay with very little instruction.

"Shay" design is the result of years of experience with geared locomotives. The details of construction have been thoroughly worked out with

A 14-B Bucyrus shovel owned by Froemming Brothers of Milwaukee, Wisconsin working on a street grading job in the city once made famous by Mr. Schlitz. The street will be 30 feet wide, with sidewalks. The road bed is through an old dump of the Federal Pressed Steel Company and the shovel has to take out sheet iron, old pipe, scrap, etc., as well as the dirt. The material is hauled out by seven teams and 2-yard wagons. Fred Burbock is pulling the levers and Freddy Polzen is keeping the boiler hot. Walter Froemming is superintendent of the job.

30-B Bucyrus gasoline dra

These two photos of a 70-ton Bucyrus were taken 15 miles
is digging solid sand rock which is used for slides on the
1919. The material was dug very successfully for a
was encountered and shooting was necessary.
the hole. The rock was loaded on flat cars
point was 28 miles, only 30 cars a day
is W. S. Dixon,

Grande Project of the United States
ervice

A 35-B Bucyrus shovel, owned by the Floridin Company mining Fuller's Earth near Quincy, Florida. Western dump cars are used for hauling.

s, on the Dalsa Division of Southern Pacific Texas Lines. The shovel
shovel was in this cut only two months, November and December,
but during the last ten days of operation some very stiff digging
50 feet apart and shot with 50 pounds of black powder to
cars. As the distance from the shovel to the unloading
eman who can be seen in the photo on the right
J. T. Holdner was cranesman.

particular reference to the unusual conditions of operation found in quarries and similar lines of industries. The parts which are subject to renewal are easily accessible for inspection and repair and are so designed that they can be replaced when worn, at a minimum amount of cost and lost time. There are a number of examples of these engines being continuously in operation in districts where machine shops and repair facilities are surprisingly small.

The operator wants his plant to make money. To do this he must have the best, most efficient transportation system he can get. It pays him to study his operating conditions carefully and select the size and type of motive power which best fits his particular needs.

The choice of unsuitable locomotives may be disastrous, and the desirability of careful analysis of any operation is clearly of vital financial importance to the man who owns it.

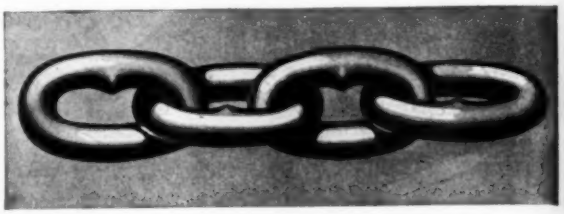
Lima Engineers are ready and glad at all times to co-operate with him in the analysis of his requirements and give him the benefit of their suggestions.

A New Idea in Chain Making

With the large number of improvements in electric welding, the trade is now being supplied almost universally with electric weld chain in all the smaller sizes up to ½" and ¾" material.

There are a number of different methods of forming and welding the links but in all cases there is a flash of material at the point of welding brought about by the intense heat of the electric current and by jamming the two ends of material together when the weld is accomplished. Some manufacturers have left this flash, or swell, without trying to remove it because of the extra strength that it gives the weld, while other manufacturers have invented means of either grinding or shearing the flash away so as to make the link smooth at the welded point.

A new method of electric welding has just been completed, and is offered to the trade under what is known as "Inswell Chain," by which method all of the material at the flash, or welding point,



The New "Inswell" Chain

is retained, but by a special device is forced to the inside of the link; thus retaining the strength at the weld that was formerly retained by leaving the swell all the way around. An illustration of this new method of welding is given, which indicates very clearly the form of the link that is thus secured.

The manufacturers of the chain claim that by this method the welded portion is twenty-five per cent stronger than any other part of the link and repeated breaking tests have shown that the material will pull out at the other places than the weld when tested to destruction. This kind of chain is very smooth on the outside of the links and the swelled portion on the inside of the link gives it the additional strength. The benefit of the improvement is quite apparent to anyone.

The method of manufacturing to this special pattern is patented and the name "Inswell" has been copyrighted by the manufacturers, The Columbus McKinnon Chain Co., Columbus, Ohio.

SHOTS FROM THE FIRING LINE

Alabama

Joe Bennett and T. R. Bennett are operating a 70-ton Bucyrus shovel for the Birmingham Slag Company, at Ensley. This shovel is loading slag and ballast. D. E. White and R. D. Bonham are craning on this shovel.

Arizona

C. A. Williams is operating a Class-7 Bucyrus Electric Dragline for the Roy Consolidated Copper Company, at Hayden. This dragline is building dykes, moving about 900 yards per 8-hour shift.

Williams address is Box 511, Hayden.

California

Horace Martin is operating a 70-C Bucyrus shovel for Marsh Brothers, at Ledwell. This shovel is employed on a 10,000 yard earth moving job. His address is 230 North Main Street, Los Angeles.

E. J. Moynihan and H. S. Boone are operating an 18-B Bucyrus shovel for Bates & Borland, at Felton. This 18-B is on a highway construction job, building highway from Ben Lomond to Bigtrees. J. C. McCracken is firing on this job.

S. Moore is operating a Browning Locomotive crane for Bay Development Company, at San Francisco. His address is 418 Pierce Street.

State Water Commission granted 2 permits to Leon Bly, San Francisco, for the diversion of water from Eagle Lake, Lassen County, for the irrigation of land in said county. Estimated cost of the proposed works, $1,000,000. Three permits were granted to Williams Irrigation Dis-

trict, located in Colusa County. Diversion by pumping and main ditch ten miles long. Estimated cost, $250,000. Excelsior Water and Mining Company, 920 Forum Bldg. Sacramento, Calif., for 110,000 acre ft. per annum from Middle Fork of Yuba River, tributary of main Yuba River in Sierra and Nevada Counties, for irrigation of 53,000 acres. Diversion by means of main tunnel 3.8 miles long. Estimated cost $1,600,000.

Canada

Vancouver Notes

Seven hundred men on April 1 start construction work on the Pacific Great Eastern Railway, between Quesnel and Prince George, according to an announcement made by John B. Bright, assistant engineer in charge of construction.

The provincial government engineers, it is understood, have solved the problem of the proper location for the road to connect the coast of British Columbia with the interior. They propose a new Princeton-Hope route, of which about 18 miles is already on the proper grade, and it is estimated that the whole could be constructed for approximately $350,000. The government, however, is not anxious to go ahead with the project this year, the present intention being to defer the beginning of construction until 1922.

To carry the Pacific Great Eastern Ry. from Prince George northerly and easterly to the inter-provincial boundary, between British Columbia and Alberta, will cost about $18,000,000, according to an estimate made by C. Williams, surveyor, employed by the Government to determine feasible routes.

The Provincial Government plans to spend $15,000 on dyking work on the Serpentine Flats, near Survey, in connection with the Pacific Highway. Minister of Public Works, Hon. J. H. King.

W. C. Taylor, representing Porter Bros. contractors, of Spokane, Wash., is in Lethbridge for the purpose of investigating the plans for the Lethbridge Northern Irrigation District. Mr. Taylor states that his firm will bid on the construction work if the District can be financed this summer. A contract, he said, had been prepared for submission to the legislature.

Edmonton and Vicinity

The Incorporation Bill of the Imperial Pipe Lines Ltd., which is a subsidiary company of the Imperial Oil Co., and capitalized at $50,000,000 has passed the second reading in the Alberta Legislature. The intention of this Company is to build a pipe Line from the northern oil fields at Fort Norman to Civilization.

The Charter rights of the Burns Road which was to run from Okotoks, South West of Calgary to the Sheep Creek Coal Fields a distance of fifty miles, has been extended two years. This Charter was taken out by Pat Burns of the P. Burns Packing Co. Ltd.

Several Prominent Albertans have applied to the Dominion Government for a Charter to build a Railroad from Ft. McMurray on the Athabasca River in a North Westerly direction along the McKenzie River to the new oil fields. The distance will be about six hundred miles.

The Hudson Bay Co., have applied for a charter to build a light railway around the Portage on the Slave River between Ft. Smith and Ft. Fitzgerald, a distance of sixteen miles.

The Alberta Legislature have passed the bill guaranteeing the bonds for the Lethbridge Northern Irrigation project and the amount is $5,400,000. Bids will be asked on this work at once.

The Canada Land and Irrigation Co. of Southern Alberta are starting two Monhigan Drag Lines and one steam shovel this month.

The Province of Alberta have appropriated $2,100,000 to put the Alberta Great Water Ways Railroad in as good condition as possible for the coming season's rush into the north country. This railway is 300 miles in length and connects Edmonton with Ft. McMurray.

D. Tredway and Son have taken a contract at Kinistino, Saskatchewan, on the Waterend Lake Job and are moving their Lidgerwood Drag Line to that place at once.

Illinois

Bids for 125 mi. of highway recently opened by the Illinois State Highway Department show considerable decrease as compared with 1920 bids. The average cost in 1920 was $44,000 per mile. This year's bids show an average of $37,850 per mile for northern and central Illinois, and $44,250 for southern Illinois.

Contractors state that bids would have been much lower but for the increased freight rates, which are 40% higher than last year. Specifications this year call for an 18-ft. road, while the specifications last year called for a 16-ft. road.

J. P. Babcock was the successful bidder at Bloomfield, Mo., on the J. W. McColgan Drainage District.

The A. Y. Reed Sand & Gravel Co., Elgin, have started the plant for the year's business. Mr. Reed, Dr. Gillett and the Supernaw Bros., have one of the best sand and gravel layouts in the country.

Bids submitted for grading and bridge work in ten counties when analyzed today showed that contractors believe Governor Small meant to get "a dollar's worth of roads for every dollar spent."

The bids show a decrease of 17 per cent for grading and 11 per cent for bridge work from the February 18 estimates. The saving is $86,899.

Governor Small directed Col. C. R. Miller, director of public works and buildings, to let the contracts to the lowest bidders.

The specifications used in yesterday's bids were the same as in those rejected February 18.

Here is a comparison:

	Grading	Bridge work
February 18	$333,601	$288,368
April 12	277,564	257,516
Saving	56,037	30,862

The counties in which the work is to be done are Whiteside, Ogle, Bureau, Henry, Knox, Effingham, Wayne, Edwards, Williamson and Franklin.

Chicago and Vicinity

Mr. Wm. J. Lester of Pittsburgh, Pa., one of the pioneers in the coal stripping game, was a recent visitor here. Mr. Lester is associated with Mr. Sherwood and they now have two operations, The Locust Hill Coal Co., Point Marion, Pa., and Sherwood-Lester Coal Co., Liberal, Mo.

Mr. T. J. Clarke of the Clarke Construction Co., Clinton, Iowa, was a visitor here this past month. He has just been awarded a ditching contract between Estherville, Ia., and Gruver. He has just purchased a Bucyrus Class-7 gasoline operated dragline for this work.

Bids for the construction of a 7,700 foot section of the Conners Creek sewer were opened by the Dept. of Public Works, March 29th. This sewer according to Mr. Clarence Hubbell, City Engr., will be the largest sewer in the United States. It is a three barrel sewer, three sections each 15 ft. 9 in. by 17 ft. 6 in., being laid side by side. The completed sewer will cost approximately $14,000,000.

The T. A. Gillespie Co. of New York were successful bidders. Mr. Jack Dillon will have charge of this work.

Mr. Edmund T. Perkins, well-known drainage engineer, of this city, sailed March 15th for Barranquilla, Columbia, South America, to report upon construction work.

Mr. Nelson C. Field of Brunswick, Mo., one of the Drainage Commissioners, was a visitor in this city, and reports that there are several good sized jobs to be let this coming summer.

Mr. Lee Bigley of the Reliance Coal Co., Pittsburgh, Kansas, was a recent visitor in this city. He has nothing new to report from the Pittsburg field.

Bids were opened Monday, April 4th, in the office of Edmund T. Perkins Engr. Co., 38 S. Dearborn St., consisting of levees, diversion work, Valley City Drainage and Levee Dist., Pike County, Ill. The bids were received from Nash-Dowdle Co., The McWilliams Dredging Co., W. E. Callahan Co., and the Northern Dredge & Dock Co.

All bids covering Grant Park improvement received by South Park Commission on March 9th and covering ½ million yards filling have been rejected by South Park Commission. Advise work will not be done at present.

H. W. Nelson of the Mellon-Stuart-Nelson Co. has withdrawn from the company, and will carry on contracting business in this city under name of H. W. Nelson.

Influence of Governor Small's rejection of recent road bids was shown April 6th, when in opening new bids, Col. R. R. Miller, director of public works and buildings, found the offer of the McCall Const. Co., to build 14.88 miles in Kane County for approximately $23,000.00 a mile.

Following rejection of previous bids, February 18th, Gov. Small announced he considered $30,000.00 a mile a reasonable price.

McCall's bid met the Governor's figure exactly, as the figure did not include the cost of cement which is estimated at $7000.00 a mile.

The McCall bid for the entire work was $345,000.00. Nine contractors bid. The three lowest bidders were, The McCall Construction Co., $345,000.00, Illinois Road Paving Co., $431,520.00, and Wilson A. Jacks, $441,673.93.

Other bidders on this work were—Ready & Callahan Co., this city, $481,415.34; Henry W. Horst Co., Rock Island $449,616.59; Frank Cohen, Buffalo, N. Y., $489,599.61; Bates & Rogers Construction Co., this city, $499,085.27, and the Keokuk Quarry & Construction Co., Keokuk, Ia., $432,718.11.

Indiana

Contracts for country highway awarded as follows: Hill road, to MacClintic, Calwell & Gordy of Syracuse, 2.52 miles, at $82,227; Biggins road, county highway, 314ths miles, at $29,051; L. P. Beard Construction Co., of Portland, for Parks road, 4.25 miles of gravel and 4.73 miles of concrete, at $153,319. Contracts for Twp. highway awarded to MacClintic, Calwell & Gordy of Syracuse, for 2.71 miles, known as the Shook road, at $88,935. A. A. Gast & Son, Warsaw, for 2.52 miles of Harvey road, Twp. highway, at $97,170.

Contracts for the Noble County Rd. awarded as follows: George Buckles road, Washington Twp., 7 miles, to Pinnu & Sewell, for $27,000; Hiram J. Earnhart road, York Twp., 5 miles, to Jacob Lindsey and Gordon Adair, at $29,757; Ellery J. Case road in Swan Twp., 4 miles, to John Veazey, at $26,950; J. Stuckman road, Noble Twp., 5 miles, to Pinney & Sewell, for $19,900.

Iowa

Dallas Co. let following contracts grading, draining, etc., 3 mi. primary road between Adel and Redfield, Div. C, involves 43,862 cu. yd. excav., 36,740 lin. ft. 6 in. tile and 4 intakes; Div. D, 34,041 cu. yd. excav., 50,275 lin. ft. 6 in. tile and sixteen 12 in. intakes, etc. grading, to Hychem & Stewart Omaha, Neb., $32,719, tile, to Adel Clay Products Co., Adel, $13,574, tile labor, to B. Skarr, Lorenz, $0.06 per ft.; surfacing Woodward-Burton-Perry-Adel Rd., involving 35,940 cu. yd. gravel, etc., to Pestotnik Bros., Boone, $57,916.

Polk Co. let contract grading 117,600 cu. yd. Runnels Highway, to C. O. Mitchell, 15th St. S. W., Des Moines, at $0.38½ per cu. yd.

Allamakee Co. let contract improving 3 mi. Waukon-Postville Rd. and 4 mi. Waukon-Lansing Rd., involving 49,723 cu. yd. excav., and 19,055 lin. ft., 6-12 in. tile, to R. Condon Co., Omaha, Neb. About $45,000.

The Mankato Construction Co. was awarded contract for grading approximately 65,715 cu. yds. in Howard County at 48c per yd. J. W. Cox of Clear Lake, awarded contract for tile on Federal Aid Project No. 93, 75,970 ft. of 6 and 18-in. tile, at 9.8 cents per ft. The Harrison Transportation Co., of Des Moines, awarded labor contract on the tile at an average of 11⅝c per ft. Dart Sales Co. of Waterloo, awarded contract for the completion of graveling on Federal Aid Project No. 31, a distance of about 11 miles, at $21,533.

Kansas

John Cawthorne is operating the Bucyrus 70-C shovel for the Ash Grove Lime & Portland Cement Company, at Chanute Quarry. Claude Burt is craning this shovel.

B. H. Byrd is operating the 88-C Bucyrus for the Ash Grove Lime & Portland Cement Company, at the same quarry. H. L. Walden is craning this shovel. Fred Padley is superintendent of this quarry.

Franklin Co. let contract building road, Federal Aid Project 70, to Cook & Stucker, Ottawa, $14,321.

Louisiana

Jim Owens is still on the job of Hearin & Andrews on the Atchafalaya River Levee. Jim reports that he broke all records last month.

S. A. Lacy is operating for the S. P. R. R. loading material to widen embankments at Schriever.

Maryland

Sanford & Brooks, 24 Commerce St., Baltimore, were the successful bidders for the contract to dredge a 40-foot channel in Norfolk Harbor. U. S. Engineers office, Washington, was in charge and the price at which the job was let is $130,500.

Actual work of developing the Chesapeake and Delaware Canal, linking the Delaware and Chesapeake Bays, is to be begun this month by the U. S. Engineer Corps, it has been announced by Colonel E. N. Johnston, in command of the Wilmington District. Bids have been asked for the excavation of 330,000 cubic yards of earth, for which the available contractors' estimates is $250,000.

Twenty-six bids were received and opened by the United States engineer at Wilmington. The contract is for the excavation of 330,000 cubic yards, and $250,000 is available for the purpose. W. H. Gahagan, of Brooklyn, submitted a bid of 37 cents a yard, which was the lowest of the twenty-six bids. It is proposed eventually to make the canal 25 feet deep and 90 feet wide.

First cut will be made just west of the Delaware Railroad crossing at the station known as Canal. There is a direct descent of some fifty feet from brow of the land to canal level. The present usable depth of the canal is nine feet and the controlling width, as measured by the locks, is 24 feet. It was planned when the waterway was taken over by the government nearly two years ago to deepen the canal to 25 feet and increase its width to 90 feet. So far as authorized, however, the canal is to be deepened to 12 feet tide level with a 90-foot width at the bottom. Eventually it is expected the depth will be increased not only to 25 feet, but to 35, which with a 90-foot width, will enable battleships and cruisers, as well as large steamships to pass freely from Delaware bay to Chesapeake or vice versa.

State Roads Comns., 601 Garrett Bldg., Baltimore, let contract to Thomas, Bennett & Hunter, Westminster, at $127,008, for resurfacing 4.13 mi. highway in Carroll Co.

The following were low bidders for the construction of roads: Bester & Long of Hagerstown, for road from Hagerstown to the Pennsylvania line, 3.83 miles, and for macadam resurfacing, at $52,660; Thomas, Bennett & Hunter of Westminster, for the Libertytown to Ceresville road, 4.02 miles, at $69,908; Christhilf & Ensey for the construction of concrete shoulders on the Annapolis Blvd., 1 mile, near Waterford, at $13,833; F. M. Latham Co., Baltimore, for road from Glenburnie to Seven Cross Roads, Anne Arundel County, 2.02 miles concrete, at $67,331; J. R. Phillips, Jr., of Berlin, for Eldorado to Federalsberg road, Dorchester County, 2.01 miles of concrete, at $58,476; Broad Creek Contracting Co., road through Princess Anne, together with bridge, 1 mile concrete, at $36,556; G. B. Mullin Co. of Washington, Rockville to Hunting Hill, Montgomery County, 2.67 miles of concrete, at $85,239.

Michigan

John Decker, West Branch, awarded contract for improvement of 2.407 miles of road in Big Creek Twp., Oseola County, including stumping, grading and graveling, at $31,739.

The following road contracts were awarded: Ociana County, Grant Twp., 3.56 mi., to O'Conner & Whiting, Grand Rapids, at $86,968; Ociana County, Shelby Twp., 7.688 mi., to New Era Road Building Co., New Era, at $218,245; Ociana County, Hart Twp., 2.07 mi. to O'Conner & Whiting, at $64,005; Berrien County, Watervliet-Benton Twps., 5.049 mi., to Kalamazoo Paving Co., at $182,382; Allegan County, Casco Twp., road to Casco Twp. Board, South Haven, at $22,500; Barry County, Johnstown, 3.44 mi. to E. A. Campbell, Vicksburg, at $45,040; Oakland County, Springfield-Groveland Twps., 5.280 mi., to Butler Constr. Co., Waukesha, Wis., at $196,-205; Oakland County, Groveland-Holly Twp., 4.767 mi., to Globe Constr. Co., Kalamazoo, at $173,609; Wayne County, Taylor, Brownstown, Dearborn, Twps., 14.211 mi., to Wayne Co. Road Comm., Detroit, at $569,522; Genawee County, Franklin, 4.087 mi., to Meredith & McVaugh, Detroit, at $156,362.

Eph Meredith, 220 Horton St., Detroit, awarded contract for improving 4.87 miles of road in Lenawee County, at $156,362.

Minnesota

Aitkin Co. let contract grading and graveling 9 mi. Federal Aid Project 149, State Rd. 3, 24 ft. wide, to Pogue-Arundel Constr. Co., 3426 Pillsbury Ave., Minneapolis, $46,721; grading 8 mi. Federal Aid Project 120, State Rd. 1, 24 ft. wide, to A. Olson and P. Cayo, Tamarack, $28,818.

Mississippi

G. A. Langhoefer, Superintendent, 3rd District, Mississippi River Commission at Gunnison reports that he has just closed the season on levee construction with his Bucyrus tower excavator No. 903, having excavated 700,-000 cu. yds., with this machine, which he claims to be a record. He states further that in the month of March, 73,000 cu. yds., were moved in twenty 10-hour working days. On March 23 this machine moved 4,200 cu. yds., in 9 hours 58 minutes on a 500 ft. haul. The machine is operated by J. G. Davis and J. R. Perry. A Class 9½ Bucyrus dragline on this same work is operated by W. F. Keller.

Missouri

J. J. Herr is operating a 65-ton Bucyrus shovel for the Missouri Pacific Railroad, at Poplar Bluff. This shovel is employed on a 1500 yard job on earth moving for bridge filling. G. M. Dukemine is craning this shovel. Their addresses are Room 108 Fulk Bldg., Little Rock, Arkansas.

New Madrid Co. let contract building 19.81 mi. Federal Aid Project 40, 16 ft. wide, to W. D. Lonergam, New Madrid, $257,199.

State Highway Dept., Moberly, let contract building 1.66 mi. Six Mile Lane (Moberly Special Rd. Dist.), Federal Aid Project 22, Randolph Co., to Moberly Paving Brick Co., Moberly, $61,580.

State Highway Dept., New Madrid, let contract building 3.918 mi. Cairo-Poplar Bluff Rd. Federal Aid Project 120, New Madrid Co., to Manegold Contg. Co., Title Guarantee Bldg., About $70,000.

The McWilliams Dredging Co., of Chicago, Ill., awarded contract by Supervisors of Union Twp. Drainage District, Lewis County, La Grange, for the construction of 550,000 cu. yds. of levee embankment and 230,000 yds. of open ditches, at a total cost for levees and ditches of $147,000.

Nevada

L. C. Pendell has been running an 85-ton Bucyrus shovel for the Nevada Consolidated Company, at Ruth. His address is 2525 Peralta Avenue, Oakland, California.

New York

John Bernado is running the 18-B Bucyrus traction mounted shovel, owned by Fred Schneider, Inc., on that Company's cellar excavation work at 170th Street and Fort Washington Avenue, New York City.

The U. S. Army Engineers office at 39 Whitehall Street, New York, are advertising for bids for the dredging and rock removal project in the Bronx River which is estimated will cost $225,000. The bids were opened on April 21st.

North Carolina

Mr. M. C. Kennedy is running an Osgood 18 for Huffstetter & Ginn at Rutherfordton. They are having good weather and are making the dirt fly.

Northern States News

County road work has become more active in the State of Minnesota during the past month. Following are the names of contractors who were successful bidders on the excavation work of some of the projects which have recently been let.

The excavation for the construction of State Roads Nos. 1 and 2, comprising approximately 126,065 cu. yds. and 61,870 cu. yds., respectively, was let on April 6th at Park Rapids, Hubbard County, Minnesota, to Messrs. Strom, Degerness & Hanson of Gary, Minnesota. The excavation work on State Road No. 9 was awarded, on the same date and at the same place, to Ole Lunda, Marrifield, Minnesota. S. R. No. 9 consists of approximately 38,479 cu. yds. of excavation.

White, Brown & Leahy, Great Falls, Montana, were the successful bidders on Job 2101 of State Road No. 7 which was open for bids on April 7th at Mankato, Blue Earth County, Minn. This work comprises approximately 22,997 cu. yds. of excavation. The larger State Road Job 2102, for the construction of 11.2 miles with 122,799 cu. yds. of excavation, which was also open for bids at Mankato on April 7th, is being held until April 29th to see what the Minnesota Legislature does relative to refundments on trunk roads.

The Washington County road work, Jobs 2101, 2102 and 2103, was awarded on April 5th as follows: State Road No. 8, Job No. 2102-02, length eight miles, to Albert F. Lehrer, South Stillwater, Minnesota; State Road No. 7, Job No. 2103, length 2.5 miles to Chas. F. Johnson, Center City, Minn.

F. A. P. No. 30 and State Job 1914 of Wright County, Minnesota, involving 124,124 cu. yds. of excavation, was awarded on April 12th at Buffalo, Minn., to Nolan Bros., Minneapolis, Minn.

Sealed proposals were received on April 12th at Albert Lea, Freeborn County, Minnesota, for the construction of State Aid Job No. 21:08 on S. R. No. 8, 5.58 miles in length with approximately 59,740 cu. yds. of earth excavation. Swan Forsberg of Albert Lea, Minnesota, was the successful bidder.

The Ajax Dredge Company of Glencoe, Minnesota, was awarded the excavation contract for the construction of Judicial Ditch No. 4, Isanti and Chisago Counties, Minn. This Company was also the successful bidder on the construction of County Ditch No. 19 of Isanti County.

Notes from the Pacific Coast

BY L. T. RUSSELL AND C. W. WHITNEY

Bonds have been voted by the Auxiliary Eastern Canal District, Chandler, Arizona, for $2,000,000 to cover a pumping station, cement lined main canal 22 miles long, 107 miles of lateral ditches, and other works. The land to be irrigated under the project approximates 40,000 acres and lies east of Salt River project. Howard S. Reed and Sheldon K. Baker are engineers for the project.

The Tule and Baxter Irrigation District comprises a total of 25,000 acres. Bonds to the extent of about $1,000,000 will shortly be issued to construct irrigation ditches for Leon Bly, Litchfield, Calif. who controls the districts. Thomas H. Means, San Francisco, is the consulting engineer.

Redmond & Page of San Francisco have been awarded contract for $194,000.00 for the construction of the first unit of the Alkali Lake reservoir for the Walker River Irrigation District, Yerington, Nevada.

Clark & Henery Construction Company of Stockton, have been awarded a contract for $175,000.00 for improvement of streets in city of Reno, Nevada.

The Turlock & Modesto Irrigation Districts are planning to proceed with construction of railway from Hetch-Hetchy Junction at Rosasco, to the site of the Don Pedro Dam, a distance of 8½ miles. A spur of 1½ miles long will be constructed to the gravel beds.

Mercer-Frazer Company, Eureka, have been awarded a contract of 12 miles of a concrete highway between South Scotia bridge and Fortuna, contract price being $160,925.00.

Bates & Borland of Oakland have been awarded a contract by the California highway commission for construction of 11.5 mi. of concrete highway between Paso Robles and Estrella River, contract price being $270,667.

Lynn Atkinson of Los Angeles has been awarded a contract for 15.4 miles of concrete State Highway in Kern County between south boundary and Mohave, price being $258,251.00.

Among recent applications for water rights filed with the State Water Commission of California are the following: Electric Metals Company, San Francisco, Klamath river, 145,000 H. P.—diversion by means of two large concrete dams; Roy H. Elliott, San Francisco, diversion from north Yuba river and middle fork of Yuba river, power development totaling nearly 100,000 H. P., diversion by concrete dams, ditches and tunnels; Excelsior Mining and Water Company of Sacramento, south Yuba river, for irrigation power purposes; cost approximately $7,000,000; United States Reclamation Service, Orland, Stony Creek in Glenn, Colusa and Tehama Counties, 30,000 acres, estimated at $300,000.

Palmer & McBryde have resumed work on grading 13 miles of logging road for the Western Pacific R. R. from Hawley east of the Davies Lumber Corporation mill. Work on this project was started last year but had to be discontinued when bad weather set in.

George Pollock Company, Sacramento, is busy starting in work with contract on District No. 853 west of Biggs, California. This company is using a Marion dragline, a clamshell rig, a Monighan dragline and a Bucyrus Class-14 dragline for the work.

The Union Rock and Gravel Company are operating their 30-B Bucyrus shovel at their Brush Canyon quarry with compressed air supplied from an electrically driven compressor. Every indication is that this installation will be a great success, and if so, a number of other shovels in Los Angeles and vicinity will be equipped in a similar manner.

J. R. McKnight received his Bucyrus shovel about the 21st of March and has been very busy since, having completed two fairly large jobs, with three more contracts on hand. This machine is equipped with a 16′ dipper stick and boom hoist. It is very useful in loading material where a high lift is required as it is able to load trucks at an elevation of 11′ cut above the wheel base of shovel.

Virtually all the steam shovel copper camps in the Southwest have closed down because of the dull market for the finished product, the various mines having on hand millions of dollars worth of copper with a very quiet market. This will not continue long, however, and we confidently expect a material change before the summer is over.

J. A. Hill, a contractor of Los Angeles, has started work on the excavation of the Second St. tunnel. This is a job that has been held up for a long time, but all legal obstacles have been cleared away and the job is to be put through to a finish.

C. R. Butterfield, of Butterfield and Dodson, has quite a job of excavation at San Pedro with considerable work promised for the future.

Due to the very low price of cotton throughout the latter part of 1920 and to date, conditions are not very favorable for much additional irrigation work and improvements during the present year either in the Imperial Valley or the Salt River Valley near Phoenix, Arizona. There is, however, considerable work in a contracting way that is badly needed, and no doubt financial conditions will so adjust themselves in the near future that much of this work can be taken up and carried out successfully.

Business among the contractors is somewhat quiet in San Francisco and vicinity, but there is now being made quite an effort to secure a sum of money for highway construction through the sale of bonds which were voted last year.

Marsh Bros. and Gardenier are using a standard shovel and some other equipment on opening some tunnels and other work on the Tehachapi Pass of the Southern Pacific Railroad.

Shattuck & Edinger of San Francisco and Los Angeles have a fairly large job in Southern Oregon, building a dam on the Rogue river for irrigation purposes, and also a ditch for conveying water to land in that vicinity.

Porter & Connelly, of Portland, Oregon, were successful bidders on some highway work in Eastern Oregon, which was let on April 5th.

Ohio

It is reported from Youngstown, that Washington, D. C., is having plans prepared for the construction of a commercial canal connecting Ohio River with Lake Erie, the cost of such a project coming to $25,000.

MIAMI CONSERVANCY NEWS

Mr. T. P. Green and William F. McConnell have returned to Dayton, Ohio, and have secured positions with the Miami Conservancy District. Mr. Green is on a Class-24 Bucyrus steam dragline, at Englewood Dam, and Mr. McConnell is operating a Class-24 Bucyrus electric dragline at the same place. Both machines are making good records.

The Miami Conservancy District have let the channel work at the Taylorsville Dam to the Roberts Bros. R. R. contractors, of 17 N. La Salle Street, Chicago, Ill.

Miami Conservancy District have started all of their jobs for this season's work.

Mr. Curt O'Neil, Bucyrus operator expects to be transferred from the Taylorsville Dam to Piqua, Ohio, on some work that the Conservancy has there.

Oregon

Plans for the Fish Lake dam, to be constructed on Little Butte Creek in connection with the development of the Medford irrigation district, were approved by state engineer. Cost of the development estimated at $1,250,000.

Pennsylvania

The Commissioners of Erie contemplate the paving of a 2-mile section of the East Lake road. Bids will be advertised soon.

Mr. J. B. Smith has resigned his position as general superintendent of The Stine Coal Mining Company of Osceola Mills, where he has been stripping coal with a 225-B Bucyrus shovel and a Marion 36 as a loading shovel. The coal on this job is the Miller vein and is of an excellent quality having a thickness of 6 feet with not more than 30 feet of overburden at the highest point.

Mr. Smith has recently returned from Ohio where he has been investigating coal and has located three different blocks of coal, located on three different railroads, which will make excellent stripping propositions. He also has another block in Pennsylvania for stripping. None of the above mentioned properties have more than 35 feet of overburden and the coal ranges in thickness from 3 to 5 feet on the various blocks.

Mr. Smith has been in the shovel game for the past seventeen years and has devoted six years of his time to the coal stripping business.

Pittsburgh and Vicinity

F. A. HUMBARGER

Stanley S. Weaver, Business Manager of the Interna-

tional Brotherhood of Steam Shovel & Dredgemen of America, Union Local No. 3, has tendered his resignation to take effect at once.

O. G. Beans, General Manager of the Beluan Coal Company, Wheeling, W. Va., breezed into Pittsburgh recently like a young cyclone looking for orders.

Tasa Coal Company, Uniondale, Ohio, are making general repairs to their two Marion 300 machines.

Cole Brothers, Morgantown, W. Va., have contract with the B. & O. Railroad building a seven mile mine line to a coal operation near Grafton, W. Va.

The Cleveland-Morgantown Coal Company are using an Erie B to grade triple tracks to their operation at Osage, W. Va.

H. B. Porterfield, Superintendent of the Adena Coal Company, Adena, Ohio had one of his fingers on his right hand cut off while coupling cars.

G. Susuki, Civil Engineer of the Imperial Japanese Navy was a business visitor for a few days in Pittsburgh during the past month.

It is reported that Major Richards, Albert Kask and other Superintendents and Master Mechanics, etc. of the Federal Gas Coal Company are first class mechanics and can repair all kinds of shovels, locomotives and various other machinery, including automobiles. However, we cannot understand why it is necessary to send an automobile to a small town garage to adjust a light knock in the piston when there is so much talent on the job.

Red-headed Jim Leonard, a first-class mucker and Carl Dunlap, another shovel stiff are still with the Federal Gas Coal Company.

N. F. Brown, Asst. Chief Engineer, Pennsylvania Railroad was appointed April 1st, Director of the Department of Public Works, Pittsburgh, Pa.

H. C. Turnham, Shovel Engineer is now recuperating from his recent illness at his home in Illinois. We expect Buck back in this vicinity in a month.

J. M. Floesch of Rochester, N. Y. is erecting a Class-24 Bucyrus electric dragline on his coal stripping operation at Meadowland, W. Va. We understand that this property is among the best stripping properties in this vicinity. He will use a special 35-B Bucyrus shovel for digging the coal.

Ben Hundley, Supt. of the H. E. Culbertson Company, Cleveland, Ohio informs us their big slag filling job at the Pennsylvania Railroad at Sewickley, Pa. is temporarily suspended and that work at their Mingo Junction, Ohio job is going along as usual.

On one of the rainy afternoons during the past month, we were glad to have several of our contractor and coal stripping friends call to see us and as they all arrived at once, we had such a good attendance, we really had a young *He-Convention* and all matters of local and international interest were firmly settled and we can look forward to business picking up immediately. Mr. Robert Cunningham of Turtle Creek was Chairman.

Narva Coal Company of Cadiz, Ohio are erecting their new Bucyrus 225-B shovel which will be used on their coal stripping operation at Cadiz, Ohio and work of erection is in charge of Mr. Geo. Williams.

The Wayne Coal Company are dismantling their Marion 300 shovels, one of which is on their No. 2 and one on their No. 4 operation at Parlett, Ohio. These shovels will be shipped to their new operation at Dundee, Ohio.

C. P. Mayer Brick Company are dismantling their 225-B Bucyrus and their 35-B and preparing their other coal stripping equipment for shipment to other operations. Mr. Walter Hopple is Superintendent of the job and is assisted by D. E. Gilmore.

Locust Hill Coal Company, Point Marion, Pa. are dismantling their 225-B Bucyrus shovel which we understand will be shipped to some of their other coal stripping operations.

James Dawson Callery, Jr., former President of the Duquesne Contracting Company died suddenly of pneumonia April 4th. Mr. Callery had many friends in the contracting business, as well as in the many other interests with which he was identified.

South Carolina

General Road & Drainage Co. awarded contract for constructing storm drains in the vicinity of Taylor and Gadsden Sts., at $6,945.

South Dakota

L. E. Gage, Sioux Falls, awarded contract for the construction of a portion of State Trunk Highway in Minnehaha County, known as the Salem Sioux Falls, length 10,189 miles. Earth work at 35 cents per yd.

Southern States Notes

BY C. N. BALLENTINE AND E. J. WILKIE, BIRMINGHAM, ALABAMA

C. N. Brown is operating a 70-C Bucyrus shovel for the Hall Construction Company near Mulberry, Florida, stripping overburden from a phosphate deposit.

N. E. Sutton is engineer on an 80-C shovel owned by E. W. Parker, of Tampa, Florida. This shovel is being used to strip overburden from a phosphate deposit for the American Agricultural Chemical Corporation near Pierce, Florida.

The Appalachian Logging Congress, whose membership consists of the lumbermen of Tennessee, Kentucky, West Virginia and North Carolina held a Spring meeting at Cincinnati, Ohio, April 28, 29 and 30th.

F. J. Smitz is operating a Model-28 Marion for The Smith Company, Contractors, Birmingham, Alabama.

The Daltex Gravel Company, 406 Deere Bldg. Dallas, Texas recently incorporated with P. C. Miller, Pres. and Mgr., W. G. Jenkins, Vice-Pres., and G. S. Webber, Sec'y.-Treas. This new company has a capitalization of $50,000 and will develop 84 acres of gravel for a daily production of 300 yards.

Oliver Construction Company, of Little Rock, Ark., has been awarded another 32 miles of road work in Searcy County, Arkansas.

Newell Contracting Company was awarded contract of 18.8 miles of highway, including several bridges, in Newberry County, South Carolina.

Andrew Bruce is operating an 18-B Bucyrus Shovel for National Barium Company, at Sweetwater, Tennessee.

Reports indicate that Wright & Kinnebrew have started work on their contract with the Central of Georgia Ry., near Leeds, Alabama.

Byron S. Marsh is operating one of the 14-B Bucyrus shovels owned by the O'Brien Construction Company, Birmingham, Ala., which is now working near Balsam, North Carolina.

Thomas W. Hawn, Dragline Operator, is on the lookout for work and can be reached at Saragossa, Alabama.

Spruce Pine Sand & Gravel Company are installing additional equipment for their plant near Spruce Pine, Alabama. They will furnish high grade washed and sized sand and gravel, and are making a specialty of asphalt filler.

Campbell & Hengst were successful bidders on a sewer contract let recently at San Antonio, Texas.

Considerable road work is being planned by Madison County, Alabama.

Texas

J. W. Bell is operating a Class-14 Bucyrus Dragline for List & Gifford Company, at Dallas.

His address is Room 108, Fulk Bldg., Little Rock, Arkansas. He is a member of I. B. S. S. & D. Local No. 49.

Rockwall Co. let contract grading and draining 10 mi. Royce-Chesholm Rd., Rockwall Co. Rd. 2, 24 ft. wide, to C. C. O'Neal, Gilmer, $59,044.

McLennan Co. had plans prepared paving and draining 6 mi. road from Elm Mott to West, 18 ft. wide. About $60,000. M. Hannah, co. engr.

Falls Co. received bids grading, surfacing and draining 46 mi. road, 16 ft. wide, from Cook & Arrington, Crockett, and Harris & Powell, Tyler, $308,000; C. C. O'Neal, Gilmer, $334,000; Smith Bros., Crockett, $335,000. Work involves 1,403 station clearing and grubbing, 296,912 cu. yd. earth fill, 2,363 cu. yd. sub grade, 667,168 cu. yd. gravel, 6,647 cu. yd. ditch earth excav., 2,555 cu. yd. structural excav., 1,541 cu. yd. 1:2:4 and 164 cu. yd. 1:2½:5 concrete, 117,859 lb. reinforcing steel, 197,320 ft. bridge lumber and 9,600 lin. ft. bridge piling.

Willite Construction Co., Houston, awarded contract for 16 miles of paving in Panhandle District at $280,000; Standard Construction Co. of Dallas for the paving in said district at $2,039.

C. L. Scherer, Drainage Commission Engineer, is making a survey for work along the Hillebrand Bayou for the drainage project in Jefferson County involving about $1,000,000.

Whitley Bros., Mineral Wells, awarded contract for paving Ft. Worth-Dallas Pike, a distance of about 5 miles, at $144,649; Morgan Harialson Sand Furnishing Co. of Grand Prairie awarded contract to furnish the sand for said road at $4.49 a cu. yd., at $26,175 for 75,000 cu. yd.; Mineral Wells Crushed Stone Co. awarded contract for furnishing stone at from $3.24 to $3.44 a cu. yd.

Work on the new rock crusher plant which is being installed by the Southern Pacific Texas lines at Toronto, Texas is progressing very nicely under direction of Mr. E. L. Barker, Supervisor Maintenance of Way, and operation is expected to start about May 1st.

J. T. Holdner has resigned his position with the Southwestern Cement Company at El Paso, Texas where he has been employed as steam shovel engineer and is at present on the lookout for a job. Mr. Holdner can handle any type of railroad or revolving shovel and can be reached at Box 362, Sansom, Texas.

Utah

The F. A. Dahle Construction Company awarded contract by Skeen & Skeen, the promoters of the irrigation project on the west side of Cache Valley for completion of the second level canal and pumping equipment, which will constitute the second unit of the Peterboro, Mendon and Wellsville Irrigation Company.

Virginia

According to figures recently given out by Commissioner G. P. Coleman, $4,081,101.57 is now available for road construction in this State. This includes the sum available for construction work only as distinguished from funds available for maintenance and county aid work. There is also a fund provided by the State to be used for road construction in co-operation with the counties. If the counties meet the appropriation made by the legislature, $1,800,000 in addition to the above sum will be available. Contracts for the entire sum will be let during the next four months.

The Norfolk & Southern Railway has recently awarded contracts for 9½ miles of heavy work. The work was split into two contracts and awarded to the Vaughn Construction Company of Shawsville, Virginia and the Stewart-Jones Company of Rockhill, South Carolina.

Washington

Comrs. Whitcomb Co. soon receive bids building 9 mi. Lynden-Sumas Rd. About $225,000. J. C. Hills, Bellingham, engr.

Contracts awarded as follows: Olympia Highway, Mason County, to Wood Bros. & Tomei, Pt. Angeles, $114,522; J. W. Hoover & Co., Everett, Pacific Highway in Pierce and Thurston counties, $28,939; Pacific Highway, Skagit County, $192,383; Pacific Highway, Clarke County, $196,472.

Dahlberg & Olson Box 267, Port Angeles, awarded contract for improvement on Burnett-Fairfax Highway, Pierce County, including draining, grading and surfacing with crushed rock, at $30,032.

West Virginia

C. E. Price was recently awarded a contract in Logan County. His present address is Logan.

PROSPECTIVE · CONSTRUCTION

Arkansas

Bids will be received until May 10, by Board of Commissioners of Road Improvement Dist. Nos. 7 and 9, Critenden County, for construction of 23 miles of gravel roads. Morgan Engineering Co., Engineers, Memphis, Tenn.

California

Cal., Sacramento—State Highway Comm., will make a survey of road unit about 8 miles in length between Lower Lake and Calistoga.

Florida

More than 100 representative citizens of Astor, Altoona, Cassia, Messina, Sorrento, Paisley, Umatilla, Eustis, Tavares, Mt. Dora, Clermont, Minneola, Montverde, South Clermont and other points in Commissioners' Districts 3, 4 and 5 met at Tavares Friday evening and endorsed a road project of 1333 miles in length, and every freeholder present signed the petition praying the Commissioners to bond this special road tax district for sufficient money to build said roads, reconstruct others and maintain the new work for a period of five years.

The project calls for the following roads: Altoona to Astor, Clement to Groveland-Auburndale road, Eustis to Tavares and Tavares to Mt. Dora, to be known as the Lake Shore Boulevard; Eustis to Cassie, Sorrento to Messina, Minneola along north side of Lake Minneola to Clermont-Groveland road, and from Cassia to Crow's Bluff bridge; also for the reconstruction of other roads in district to 15 feet wide.

The Alabama Florida & Gulf R. R. has asked authority from the Interstate Commerce Commission to issue $150,000 of seven per cent first mortgage bonds, part of the proceeds to pay for proposed extension from Greenwood to Marianna, about eight miles.

Georgia

The Central of Georgia R. R. will construct a side track at the old site of Camp Harris, which will be used to unload material. The side track will cost about $1,070, according to County Engineer S. R. Shi.

Iowa

Buena Vista Co. having preliminary plans prepared for Drainage Project 137. About $85,000. W. A. Kaufman, aud. A. H. Cunningham, Storm Lake, engr.

Michigan

Genesee County voted in favor of a bond issue of $3,400,000 for a road program of 150 miles of paved roads.

Missouri

Office of the Secretary, Mississippi River Commission, International Life Building, St. Louis, Mo.—Sealed proposals will be received here until 11 a. m., March 19, 1921,

"PHOTO FACTS"
ON THE SMITH EXCAVATOR

The above photos were taken on one of Contractor Giese's jobs in Milwaukee, where he and one man finished a 500 yard excavation in 2½ days.

1 First, the ground, if tough, is broken with the Smith Excavator and Loader to make digging easier. Notice in photo 1 how one man buries the plow—deep, speedy plowing.

2 Then the plow is removed and the digging slip starts excavating. One man at the slip and one at the machine can dig and load 200 yards or more daily.

3 Then the loaded slip rides up to the machine, which is always out of the hole, at street level. The machine elevates the slip and dumps the load into the wagon.

4 When the work is finished a team hauls the Smith Excavator to the next job as easily as if it were a wagon. No time lost—no expensive hoisting, planking or snatch teams required.

A man with pick and shovel can excavate about 8 yards a day, if he hustles! Two men with a Smith Excavator and Loader can dig and load 200 cubic yards or more in a day—and with less effort.

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for constructing about 545,000 cubic yards of earth work by the hydraulic method in the Bay Island Drainage and Levee District, No. 1, Ill. Further information on application.

Office of the Secretary, Mississippi River Commission, 1311 International Life Building, St. Louis, Mo. Sealed proposals will be received here until 11 a. m., May 19, 1921, for constructing about 350,000 cubic yards of earth work by the hydraulic method in the Louisa County Levee District No. 15, Ia. Further information on application.

New Jersey

Board of Freeholders of Middlesex County plan an extensive road repair program. Approximate cost, $265,000. Alvin Fox, County Eng.

North Carolina

Municipal authorities at Wrightsville Beach, near Wilmington, have under consideration plans for spending $25,000 on the construction of jetties to repair erosion of the shore line by storm during the past winter and to prevent future inroads of the ocean.

The authorities recently consulted with war department engineers and then engaged a reclamation engineer to draft plans. Damage at the beach last winter was not excessive but indicated the need of building defensive works to prevent erosion and to enlarge the ocean frontage of the island.

City of Salisbury will construct about 6 mi. sewer and water systems; total cost $53,000. Address The Mayor.

South Dakota

It is planned to begin work this spring on a $350,000 drainage project in Brookings County approximately 65,000 acres of the Big Sioux Valley.

Tennessee

Lawrence County will construct 15 mi. bituminous macadam road; $300,000. Address County Commrs.

Davidson County will construct 2.37 mi. bituminous macadam road 16 ft. wide between Nashville and Cheatham County line. Address County Commrs.

Texas

Based on a remission of state taxes for a period of twenty years, the town of Freeport, has issued bonds to cover the cost of enlarging its present levee system totaling approximately 425,000 yards of embankment. It is expected the material will be pumped from the Brazos River and from a canal in the rear of the town, using pipe line dredges.

Washington

Plans are being drawn by the U. S. Engineer at Seattle, for the dredging to be done at Ship Channel Lake, to cost about $65,000.

West Virginia

J. A. Bell, of Carnegia, Pa., and others will, it is reported, build a railroad to develop 1,000 acres of coal land in Brooke and Ohio counties, at an estimated cost of $250,000.

Rum, the Preserver

"All this talk about prohibition is the bunk," declaimed an old laborer. "'Twas whiskey saved me life oncet."

"Snake bite?"

"Snake bite, nothin'. I was diggin' a well an' come up for a drink and while I was gettin' it th' well caved in."

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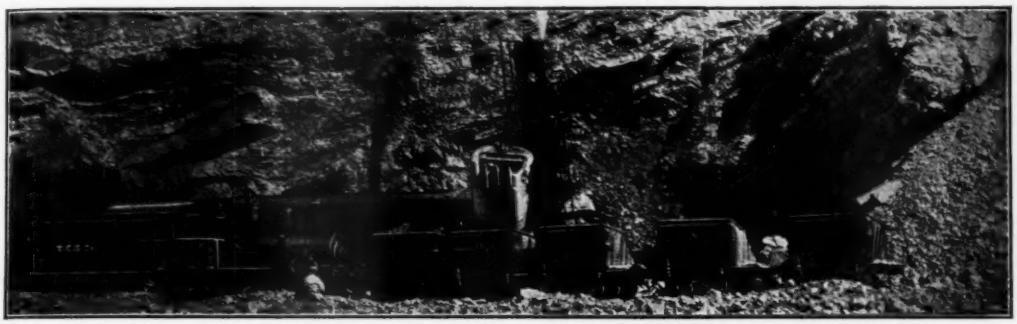

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For convenience in making inquiry use postal inserted in this number.

TRADE NOTES

Two old-timers in the steam shovel game, J. W. Bell and G. W. Laken, who are known from coast to coast among the dirt movers, have recently gone into the contractor's equipment business. Their offices are located at 401 Marvin Building, Dallas, Texas. They are prepared to furnish any kind of contractors equipment and give customers the benefit of their experience in the contracting field. They demonstrate their equipment on the job and guarantee satisfaction.

H. M. Davison was from 1903 to 1919 with the Hayward Company, manufacturers of orange peel, clamshell, electric motor clamshell and drag scraper buckets and for two years just past was General Sales Manager for Ohio Locomotive Crane Company. He has again become associated with the Hayward Company and will hereafter be connected with the management of that Company. Among other duties he will have the General Management of Sales.

The Superheater Company announces that after May 1st, 1921, its General Offices will be moved from 30 Church Street to 17 East 42nd Street, New York City.

Victor T. Goggin, late New England Sales Manager of Fred T. Ley & Co., Inc., of Springfield, Boston and New York, has severed his connection with that concern to associate himself as Contracting Engineer with Dwight P. Robinson & Company, Incorporated, of New York, Chicago, Dallas, Youngstown, Los Angeles and Montreal.

The International Pulverized Fuel Corporation announces that on and after April 20th, their General Offices will be located in the National City Building, 17 East 42nd Street, New York City.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us. Books reviewed in these columns will be supplied by The Excavating Engineer Publishing Company at the price named.

SUPERHEATERS FOR STATIONARY POWER PLANTS is the title of Bulletin No. WT-7 recently issued by the Superheater Company. This is edited to appeal particularly to the executive and has been made as non-technical as possible. It tells in simple language what superheated steam is and how it operates to increase efficiency throughout the entire steam line system of a stationary power plant. This bulletin will be sent to anyone interested by *The Superheater Company, 17 East 42nd Street, New York.*

LAKEWOOD CLAMSHELL BUCKETS—The Lakewood Engineering Company announces a new 16-page booklet in two colors illustrating Lakewood Clamshell Buckets in use on various types of cranes. The purpose of this booklet is to show Lakewood Clamshell Buckets operating under various conditions, in various types of material, and to demonstrate the "digging down" feature of the bucket.

Of particular interest is the almost complete absence of text matter. The whole story has been told in pictures. A copy of this booklet will be sent to any reader on request. *The Lakewood Engineering Co., Cleveland, Ohio.*

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are a certainty if OWEN BUCKETS are used for excavating and dredging purposes. Two new features of our latest type excavating and dredging bucket insures greater digging power (without increase of weight) than heretofore realized with grab buckets of any type. Ask for circular covering the new Type "O" and "D" Owen Buckets today.
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